

Chicken GRIFIN: A homodimeric member of the galectin network with canonical properties and a unique expression profile

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Abstract:

Occurrence of the adhesion/growth-regulatory galectins as family sets the challenge to achieve a complete network analysis. Along this route taken for a well-suited model organism (chicken), we fill the remaining gap to characterize its seventh member known from rat as *galectin-related inter-fiber protein* (GRIFIN) in the lens. Its single-copy gene is common to vertebrates, with one or more deviations from the so-called signature sequence for ligand (lactose) contact. The chicken protein is a homodimeric agglutinin with capacity to bind β -galactosides, especially the histo-blood group B tetrasaccharide, shown by solid-phase/cell assays and a glycan microarray. Mass spectrometric identification of two lactose-binding peptides after tryptic on-bead fragmentation suggests an interaction at the canonical region despite a sequence change from Arg to Val at the site, which impairs reactivity of human galectin-1. RT-PCR and Western blot analyses of specimen from adult chicken organs reveal restriction of expression to the lens, here immunohistochemically throughout its main body. This report sets the stage for detailed structure-activity studies to define factors relevant for affinity beyond the signature sequence and to perform the first complete network analysis of the galectin family in developing and adult organs of a vertebrate.

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